

REMARKS

Claims 1-19 are pending. The Examiner's reconsideration of the rejections is requested in view of the remarks.

Claims 1, 9, and 14 are the independent claims.

Claim 1 has been rejected under 35 U.S.C. 102(e) as being anticipated by Ohuma (U.S. Patent Application No. 2004/0029024). The Examiner stated essentially that Ohuma teaches all the limitations of Claim 1.

Claim 1 claims, "disposing a mask including a pattern shape over the layer formed on a substrate; and scanning the mask with the light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to form a pattern."

Ohuma teaches a method for photolithography wherein pattern forming elements are divided into respective direction relative to a projection vector of an EUV ray, so that each of the reflective masks has the same pattern forming elements extending in one direction (see Abstract). Ohuma does not teach "scanning the mask with the light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to form a pattern" as claimed in Claim 1. From Figure 1 it is clear that Ohuma specifically avoids scanning perpendicular to a longitudinal direction of the pattern shape by rotating portions of the pattern and the wafer to achieve the same projection vector of the EUV ray for all patterns (see Figure 1, Abstract, and paragraph [0038] wherein Ohuma teaches "the projection vector of the EUV ray and the respective pattern forming elements 11a and 11b of the respective reflective mask 12a and 12b is always the same.") Indeed, Ohuma teaches away from the claimed feature of "scanning the mask with the light, such that a direction of the scanning is substantially perpendicular to a longitudinal

direction of the pattern shape to form a pattern” (see for example, paragraph [0039] wherein Ohuma teaches that patterns are aligned to the direction of the projection vector of the EUV ray). Further see paragraph [0036] of Ohuma, which teaches the method of rotating the masks relative to the projection vector.

Referring to the Examiner’s Response to Arguments; the Examiner seems to argue that Ohuma’s EUV ray moving perpendicular to a portion of pattern not used in forming a pattern teaches the claimed limitations. For example, as shown in FIG 5, while moving parallel to the V-Line the EUV ray moves perpendicular to the H-Line. However, the H-Line is not used to form a pattern so long as it is perpendicular to the EUV ray as required by Ohuma’s teachings. As shown above, Ohuma teaches away from perpendicular movement of the EUV ray relative to the pattern being formed. Indeed, Ohuma’s pattern is rotated such that a pattern is formed only while the EUV ray moves parallel to the pattern. Ohuma fail to teach that “a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to form a pattern” as claimed in Claim 1. In Ohuma, any pattern perpendicular to the movement of the EUV ray is not used in forming a pattern. Therefore Ohuma fails to teach all the limitations of Claim 1.

Therefore, Ohuma fails to teach all the limitations of Claim 1. The Examiner’s reconsideration of the rejection is respectfully requested.

Claims 2-4 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Ohuma in view of Isobe et al. (U.S. Patent Application No. 2003/0218169). The Examiner stated essentially that the combined teachings of Ohuma and Isobe teach or suggest all the limitations of Claims 2-4.

Claims 2-4 depend from Claim 1. The dependent claims are believed to be allowable for at least the reasons given for Claim 1.

Claims 5, 6, and 8 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Ohuma in view of Isobe, and further in view of Kim (U.S. Patent Application No. 2003/0211404). The Examiner stated essentially that the combined teachings of Ohuma, Isobe and Kim teach of suggest all the limitations of Claims 5, 6, and 8.

Claims 5, 6, and 8 depend from Claim 1. The dependent claims are believed to be allowable for at least the reasons given for Claim 1. Reconsideration of the rejection is respectfully requested.

Claim 7 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Ohuma in view of Isobe. The Examiner stated essentially that the combined teachings of Ohuma and Isobe teach of suggest all the limitations of Claim 7.

Claim 7 depends from Claim 1. Claim 7 is believed to be allowable for at least the reasons given for Claim 1. Reconsideration of the rejection is respectfully requested.

Claims 9, 10, 14, 15, and 19 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yang (U.S. Patent Application No. 2003/0213966) in view of Ohuma. The Examiner stated essentially that the combined teachings of Yang and Ohuma teach of suggest all the limitations of Claims 9, 10, 14, 15, and 19.

Claim 9 claims, *inter alia*, “scanning the mask with a light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to expose the photoresist layer.” Claim 14 claims, *inter alia*, “forming a photosensitive layer pattern by scanning with a light through a mask, wherein a direction of scanning is substantially perpendicular to a longitudinal direction of a data line to be formed during an exposure process, and the photosensitive

layer pattern includes a first portion, a second portion thicker than the first portion, and a third portion thinner than the first portion.”

Yang teaches a process for vapor depositing a low dielectric insulating film (see Abstract). As noted in the Office Action, Yang does not disclose scanning substantially perpendicular to a longitudinal direction of the pattern shape to expose the photoresist layer. Nowhere does Yang teach or suggest “scanning the mask with a light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to expose the photoresist layer” as claimed in Claim 9, nor “forming a photosensitive layer pattern by scanning with a light through a mask, wherein a direction of scanning is substantially perpendicular to a longitudinal direction of a data line to be formed during an exposure process” as claimed in Claim 14. Therefore, Yang fails to teach or suggest all the limitations of Claims 9 and 14.

Ohuma teaches a method for photolithography wherein pattern forming elements are divided into respective direction relative to a projection vector of an EUV ray, so that each of the reflective masks has the same pattern forming elements extending in one direction (see Abstract). Ohuma does not teach or suggest “scanning the mask with a light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to expose the photoresist layer” as claimed in Claim 9, nor “forming a photosensitive layer pattern by scanning with a light through a mask, wherein a direction of scanning is substantially perpendicular to a longitudinal direction of a data line to be formed during an exposure process” as claimed in Claim 14. Ohuma teaches that a scanning direction is always the same and is always in the direction of the projection vector of the EUV ray (see paragraph [0039]. Nowhere does Ohuma teach or suggest that the scanning direction is perpendicular to a direction of a pattern shape “to expose

the photoresist layer” or “perpendicular to a longitudinal direction of a data line to be formed during an exposure process.” Therefore, Ohuma fails to cure the deficiencies of Yang.

The combined teachings of Yang and Ohuma fail to teach or suggest “scanning the mask with a light, such that a direction of the scanning is substantially perpendicular to a longitudinal direction of the pattern shape to expose the photoresist layer” as claimed in Claim 9, nor “forming a photosensitive layer pattern by scanning with a light through a mask, wherein a direction of scanning is substantially perpendicular to a longitudinal direction of a data line to be formed during an exposure process” as claimed in Claim 14. Therefore, the combined teachings of Yang and Ohuma fail to teach or suggest all the limitations of Claims 9 and 14.

Claim 10 depends from Claim 9. Claims 15 and 19 depend from Claim 14. The dependent claims are believed to be allowable for at least the reasons given for Claims 9 and 14. Reconsideration of the rejection is respectfully requested.

Claims 11 and 16 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Ohuma and further in view of Tanuma. The Examiner stated essentially that the combined teachings of Yang, Ohuma, and Tanuma teach of suggest all the limitations of Claims 11 and 16.

Claims 11 and 16 depend from Claims 9 and 14, respectively. The dependent claims are believed to be allowable for at least the reasons given for Claims 9 and 14. Reconsideration of the rejection is respectfully requested.

Claims 12, 13, 17, and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Yang in view of Ohuma and further in view of Kim. The Examiner stated

essentially that the combined teachings of Yang, Ohuma, and Kim teach of suggest all the limitations of Claims 12, 13, 17, and 18.

Claims 12 and 13 depend from Claim 9. Claims 17 and 18 depend from Claim 14. The dependent claims are believed to be allowable for at least the reasons given for Claims 9 and 14. Reconsideration of the rejection is respectfully requested.

For the forgoing reasons, the present application, including Claims 1-19, is believed to be in condition for allowance. The Examiner's early and favorable action is respectfully urged.

Respectfully submitted,

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